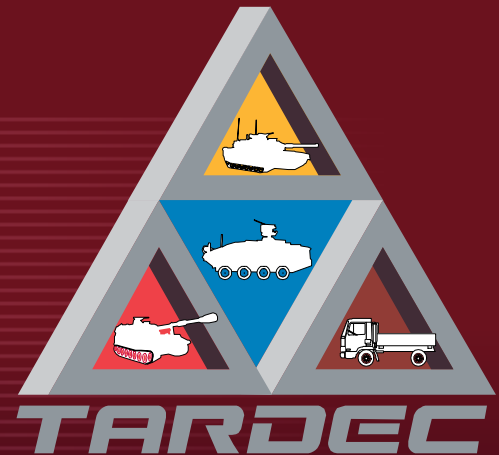




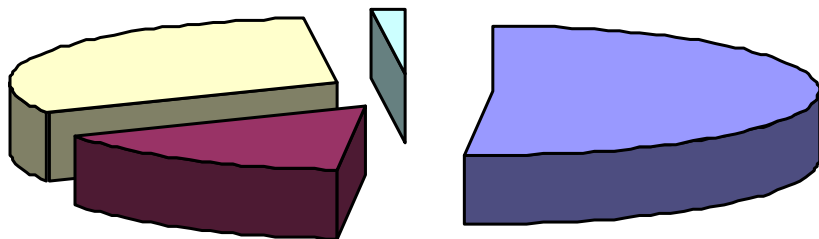
Advanced Materials for Military Ground Platforms



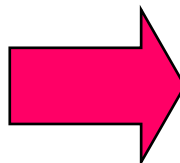
TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Dr. Douglas W. Templeton
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Development, and Engineering Center
Warren, MI 48397-5000

Report Documentation Page				Form Approved OMB No. 0704-0188	
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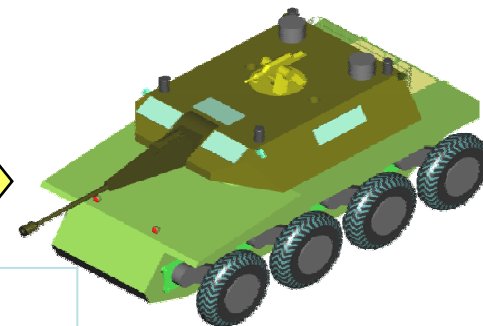
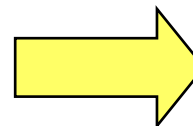
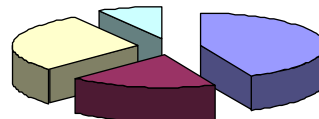
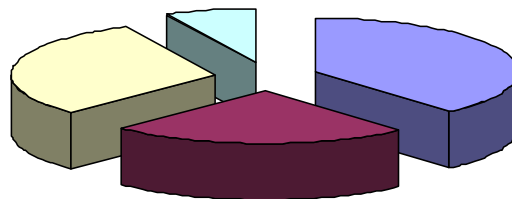


**70 ton vehicle--
36 tons for structure &
protection**



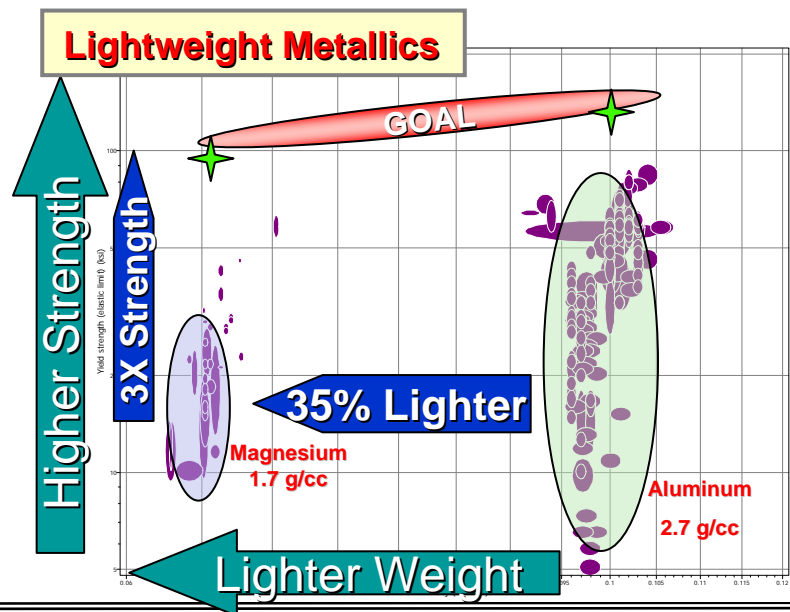
- Structure & Protection
- Lethality
- Mobility
- Other

**40 ton vehicle--
15.5 tons for
structure &
protection**

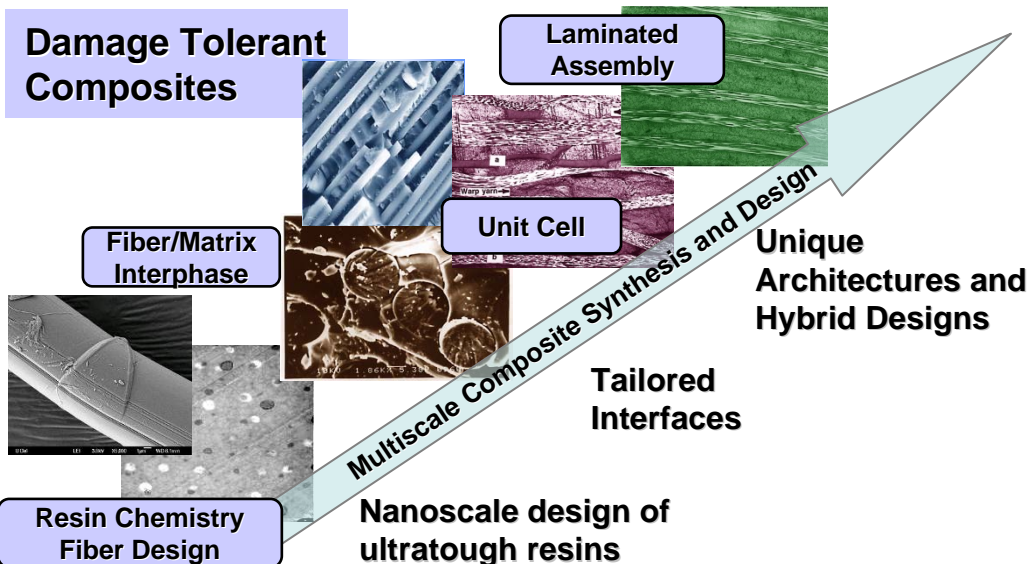


**20 ton vehicle—
8.6 tons for structure & protection!**

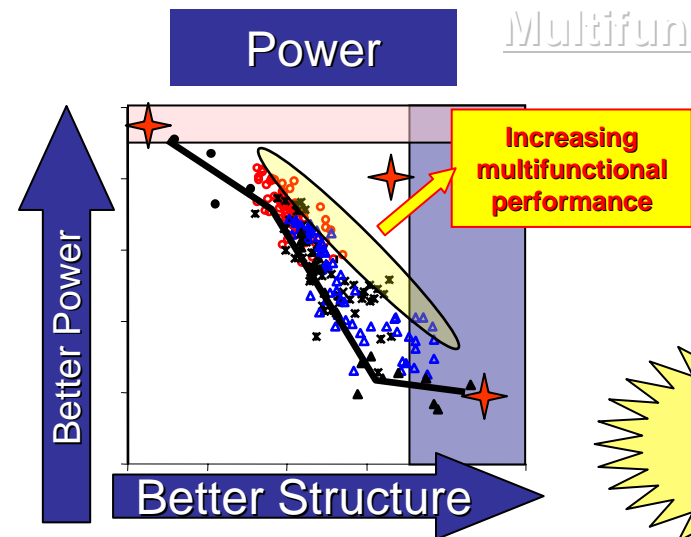
BUT ALSO NEED MORE POWER AND REDUCED THERMAL LOAD



Damage Tolerant Composites



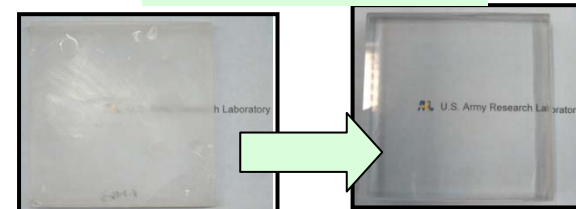
Multifunctionality: Structure plus ...



Reduced Parasitic Mass

Lighter System Weight

Transparency



New Transparent Materials

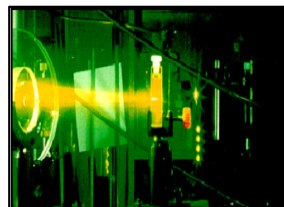
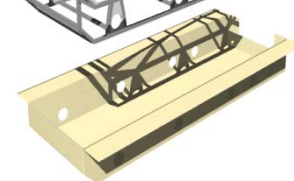
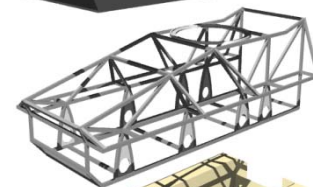
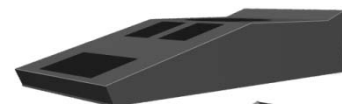
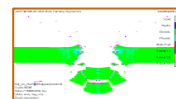
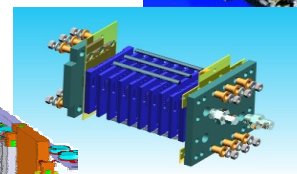
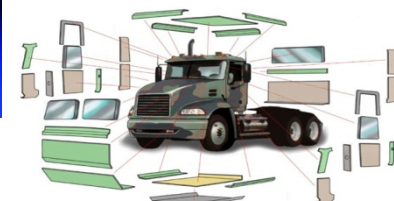
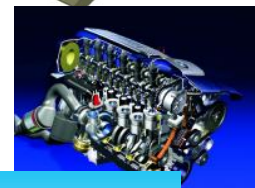
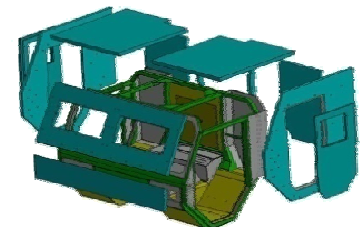
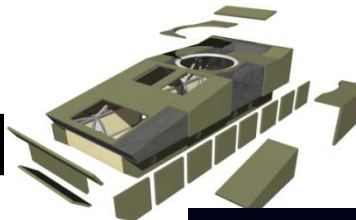
- Continuous-fiber transparent composites
- Nanoscale transparent composites
- Index matching using active materials

Materials Performance Metrics

- Translucence, haze & clarity
- Strength and damage tolerance
- Durability and reliability

TECHNOLOGY DR

- advanced structural and propulsion systems
- power electronics and electric motors
- lightweight armor
- fire suppression
- optical limiters



- ultra high strength steels
- aluminum
- titanium
- magnesium
- Ni and Co superalloys (engine applications)
- PZTs
- metal matrix composites
- ceramic matrix composites
- polymer matrix composites
- ultralight engineered materials (e.g. foams, honeycomb, and sandwich materials)
- ultra high strength fibers
- resins and adhesives

- **Modeling of Composite Materials for Energy Absorption**
- **Nondestructive Evaluation Tools for Evaluation of Composite Structures**
- **Nondestructive Evaluation Techniques for On-Line Inspection of Structures**
- **Durability of Lightweight Composite Structures**
- **Composite Crash Energy Management**
- **Joining of Dissimilar Materials**
- **Adhesively-Bonded Composites**
- **Evaluation and Prediction of the Performance/Durability of Dissimilar Material Joints**